



Thank you for choosing an Infinity Reference Series subwoofer. Reference Series subwoofers are designed to suit a broad range of mobile-audio applications and can be used in a wide variety of enclosure types to produce extended, powerful bass in a limited amount of vehicle space. To ensure maximum subwoofer performance, we strongly recommend that installation be left to a qualified professional. Although these instructions explain how to install a Reference Series subwoofer in a general sense, they do not show box-construction details and exact installation methods for your particular vehicle. If you do not feel you have the necessary experience, do not attempt the installation yourself, but instead ask your authorized Infinity dealer about professional installation options.

Remember to keep your sales receipt with this manual in a safe place so both are available for future reference.

 **infinity**[®]
reference series
1020w, 1220w
instructions

WARNING: Playing loud music in an automobile can permanently damage your hearing, as well as hinder your ability to hear traffic. The maximum volume levels achievable with Infinity speakers, combined with high power amplification, may exceed safe levels for extended listening. We recommend using low volume levels when driving. Infinity accepts no liability for hearing loss, bodily injury, or property damage as a result of use or misuse of this product.

YOUR CAR AND BASS REPRODUCTION

Depending on the size of the vehicle's interior listening space, reproduced bass frequencies below 80Hz are boosted by nearly 12dB per octave as frequency decreases in the car. NOTE: This effect, known as the vehicle's transfer function, plays an important part in shaping the overall in-car response and is displayed graphically along with freespace response on the enclosed data sheet for your Reference subwoofer.

CHOOSING AN ENCLOSURE

Reference Series subwoofers are optimized to perform best in small sealed, vented and prefabricated bandpass enclosures. While infinite-baffle mounting of Reference Series subs is possible, power handling will be greatly compromised because there's no enclosed volume of air to prevent the speaker's cone from moving past its limit. For this reason, we do not recommend infinite-baffle mounting for Reference Series subwoofers.

You should choose the enclosure you will use based on the type of music you listen to, how much amplifier power you will use for the subwoofer and how much space inside the vehicle you can devote to a subwoofer enclosure.

Because a sealed enclosure provides the most control over the woofer's movement, a woofer mounted in a sealed enclosure will handle more power than a woofer mounted in another enclosure type. Sealed enclosures provide more accurate sonic reproduction than other enclosure types, so they are well suited to all types of music. Sealed-enclosure construction is straightforward and there are many prefabricated sealed enclosures available. Optimum sealed enclosures are always smaller than other types of enclosures optimized for a particular speaker, so they require the smallest amount of space inside the vehicle.

Vented enclosures provide better efficiency in the 40Hz–50Hz range but this efficiency comes at the expense of sound in the lowest octave (below 40Hz) and at the expense of some control and power handling. If you are using a small amplifier, a vented box will provide more bass output from less power. Vented enclosures are also well suited to a variety of music types.

Because vented enclosures require the volume of the enclosure and the size of the port to have a specific relationship with the characteristics of the woofer, the enclosure must be built exactly to the specifications provided. While there are some prefabricated vented boxes available, matching a prefabricated box to a particular woofer is difficult. If you wish to use a vented enclosure, we strongly recommend having your authorized Infinity dealer build it or verify that your design is correct if you wish to build it yourself. An optimum vented enclosure is always larger than the optimum sealed box for the same woofer and will require more space inside the vehicle.

Bandpass enclosures often provide the most output available from any amplifier and subwoofer combination at the expense of sonic accuracy. If sheer SPL (sound-pressure level) is what you desire most, choose a bandpass enclosure. Bandpass-enclosure design is very tricky and the aid of a computer and enclosure design-software is necessary. If you are an experienced installer or have some woodworking experience, you may wish to build the enclosure described in the enclosure design sheet included with this woofer. Fortunately, there are many prefabricated bandpass boxes available and they are all optimized to extract the most output possible from any woofer. Bandpass enclosures can be quite large and may require a lot of space inside your vehicle.

POWER-HANDLING LIMITATIONS

The power-handling capability of any woofer is related to both its ability to dissipate heat and the maximum excursion limits of its cone. Once the speaker's voice coil moves outside the magnetic gap, power can no longer be converted into motion and all the amplifier's power is converted into heat in the voice coil. This voice-coil heating is the largest detriment to speaker longevity, so overexcursion should be avoided. Since speaker-cone excursion is different for each type of enclosure, power handling is different for each enclosure.

Sealed enclosures exert the most control over the motion of a subwoofer because the air inside the box acts like a spring against the motion of the woofer cone. Larger boxes allow for more excursion, thus providing more low-frequency output for the amount of power used. When placed in a sealed box much larger than the V_{as} of the subwoofer, it will perform as if it were in an infinite-baffle installation.

Vented and bandpass enclosures have the lowest amount of excursion for the amount of sound output. This is a result of port output reinforcing the sound output from the woofer. The mass of the air contained in the port provides an acoustic load on the woofer's cone at the tuning frequency, and this added mass decreases woofer-cone excursion. Vented boxes do not provide adequate woofer control when driven below the tuned frequency (F_b), so proper design is important. A vented bandpass box will have the lowest overall cone excursion provided a subsonic filter is used.

- Voice-coil overheating and burning due to overexcursion are often caused by overdriving an amplifier into "clipping." A severely clipped signal, or square wave, contains nearly twice the power of a clean sine wave at the same level. Bass that sounds broken up and distorted at higher volumes is usually indicative of an amplifier that is clipping and being asked to deliver power beyond its ability.
- Infinite-baffle or "free-air" mounting applications allow for greater cone excursion than subwoofers mounted in an enclosure. In order to compensate, the power handling of the subwoofer will likely be half its rated power in this application.
- Study the excursion curves on the enclosed Reference Series data sheet and note the differences for different enclosure applications. The type and size of box used will produce different excursion demands on the enclosed subwoofer and, consequently, different levels of power handling. As long as the recommended enclosure parameters are used, the subwoofer will perform properly in its enclosed environment. However, any design deviation may result in less than optimum performance, and may also subject the subwoofer to overexcursion (i.e., where the voice coil leaves the gap) that can eventually damage the speaker. For additional help with this issue, please contact your authorized Infinity dealer.

SPECIFICATIONS

Reference 1020W

Configuration:	10" subwoofer
Nominal Impedance:	4 ohms
Power Handling:	250W RMS/1000W peak
Sensitivity @ 2.83V/1m:	90dB
Frequency Response:	22Hz – 800Hz
Mounting Depth:	5-1/2" (140mm)
Cutout Diameter:	9-1/4" (235mm)

Reference 1220W

Configuration:	12" subwoofer
Nominal Impedance:	4 ohms
Power Handling:	300W RMS/1200W peak
Sensitivity @ 2.83V/1m:	92dB
Frequency Response:	20Hz – 800Hz
Mounting Depth:	6-1/8" (156mm)
Cutout Diameter:	11-1/8" (283mm)



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DECLARATION OF CONFORMITY



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declare in own responsibility, that the products described in this owner's manual are in compliance with technical standards:
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EN 55020/12.1994

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